Human Resources Development Canada
Internal Audit Bureau

Développement des ressources humaines Canada
Bureau de vérification interne

FINAL REPORT

System Under Development (SUD) Audit, Preliminary Risk Assessment of the Year 2000 Project

Project No.: 458/97

Internal Audit Bureau

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1.0 EXECUTIVE SUMMARY

Background:

To maintain normal processing of the Department's mission critical business systems into the next century, it is mandatory that the Year 2000 conversion of computer applications and related business processes be successful.

- The implications of failure are far reaching and potentially catastrophic, particularly in compensation, financial, insurance and legal applications whe:e four digit dates are critical.

- The process of identifying, converting and testing all system, programs, data, communications, hardware (i.e. microcomputers, mainframes and other equipment), and outside interfaces is underway.

- This report presents the results of the preliminary risk assessment of the Y2K initiative that was conducted from September to December 1997. Detailed recommendations and suggestions are made in Appendix B.

- The Project Team has been briefed during the assessment, and some action has been initiated.

HRDC has adequately positioned itself to proceed with this project which is now starting to gain momentum. However, despite the fact that the corporate management framework shows evidence of consolidation, Y2K accountability is not clearly defined. Horizontal recognition and acceptance of the size, scope, complexity and potential impact of the Y2K issue is not evident throughout the Department. Sustainable management commitment and action is now required.

Major Findings:

Corporate accountability for Y2K delivery is not clearly defined at all levels and to all jurisdictions within HRDC. Management acceptance exists formally, but is not yet evident throughout the Department. Awareness is growing, but Y2K is still seen as a technology problem rather than a business issue. Program areas have pressured for non-Y2K priorities, and responsible areas tend to work in a "silo" fashion resulting in resistance to the Y2K commitment. There has been improvement recently, but mandates, roles and responsibilities should be clarified.

- Senior management must promote behavioral change by clarifying accountability for Y2K delivery, mandating a higher profile for the Y2K Project Office, and pressing business areas to support corporate objectives.

- A clear corporate position on Y2K is required across all jurisdictions. In all areas of the Department, professionalism must come to the forefront in pursuing corporate Y2K objectives.

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The Federal Government has not decided how to fund the necessary Y2K work for all departments. [redacted] Although the Department is deficit funding its Y2K work, real funding is needed to complete the effort.

S.69

[redacted] Availability of experienced resources is a common problem across the government. Loss of consultants now will likely mean the inability to re-introduce them later. Horizontal recognition of the immense scope of the Y2K Project is not evident, and it is too early to determine if the Project will meet its target dates.

- HRDC needs increased flexibility to redirect resources to maintain specialized Y2K expertise. A resource reallocation strategy is required in support of system conversion, testing and implementation.

The broad scope of the Y2K initiative means that the traditional roles of Systems and Program areas are more difficult to define. HRDC currently uses a matrix organization to deliver systems development and operations services. In this case, a clear corporate view of Y2K is essential. To this end, departmental processes required for professional information technology services may not support the volume of activity needed for achievement of Y2K goals.

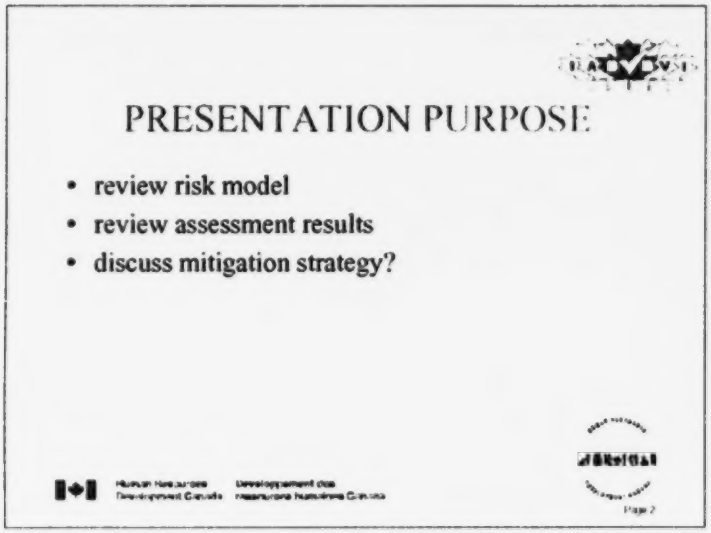
- Departmental processes require review and possibly improvement to handle the expected Y2K volume. Standard approaches to conversion, testing and implementation are needed to ensure maximum efficiency in meeting project goals. A standard testing process is under development.

- Without some active form of workload balancing, testing and implementation will become bottlenecks in the overall delivery process. Stringent monitoring is required to ensure management can react. Ongoing triage of systems is needed based on a clear definition of "mission-criticality" as better understanding of the total workload is attained.

The readiness of the technical infrastructure to carry the newly converted and tested critical systems can impact overall Y2K delivery. Although there is a good chance that HRDC will meet its infrastructure readiness goals, two areas represent increased risk.

Data communications based on the Banyan network product is a concern due to limited Y2K activity on the part of the supplier. If Banyan is not successful in delivering a Y2K-compliant product, it is likely that HRDC would not be able to convert to another solution in time. In addition, as a result of the size and overall complexity of the department, HRDC has a large number and variety of software and hardware products in use. The size of this inventory represents high risk to overall vendor compliance. These risks are well known to HRDC technical staff.

2.0 FINDINGS PRESENTATION



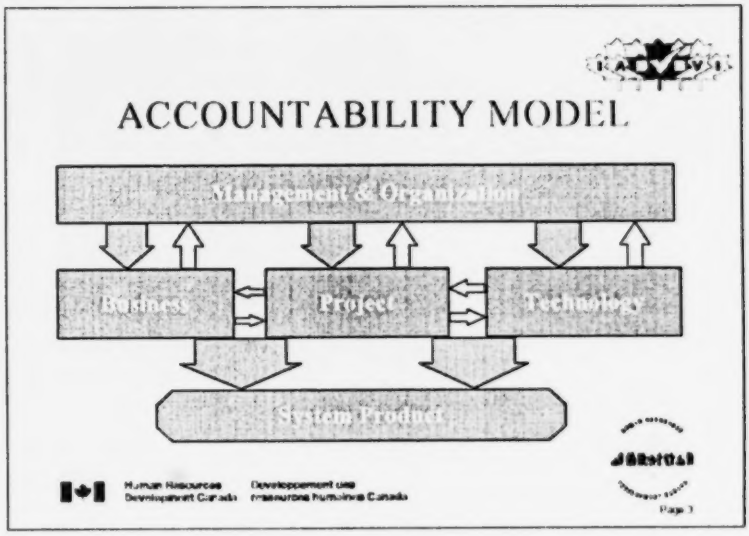
Introduction

To maintain normal processing of the Department's mission critical business systems into the next century, it is mandatory that the Year 2000 conversion of computer applications and related business processes be successful.

- The implications of failure are far reaching and potentially catastrophic.
  - particularly in compensation, financial, insurance and legal applications where four digit dates are critical.

- The process of identifying, converting and testing all system, programs, data, communications, hardware (i.e. microcomputers, mainframes and other equipment), and outside interfaces is underway.

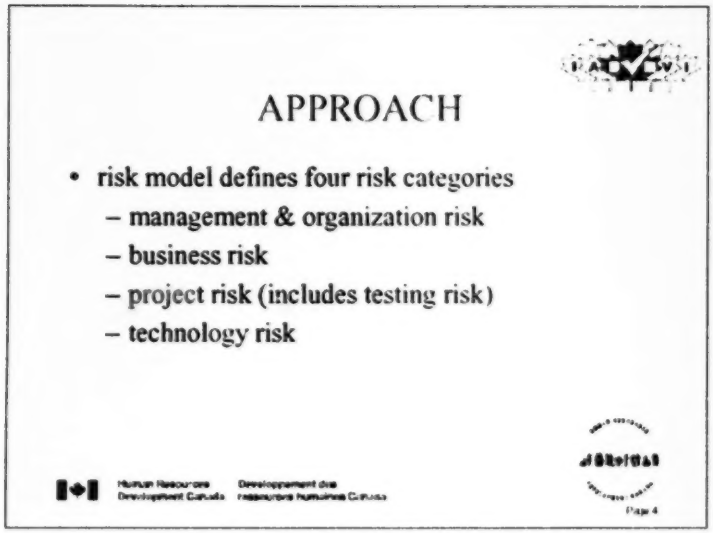
- This presentation outlines the results of the preliminary risk assessment of the Y2K initiative that was conducted from September to December 1997.
  - it also presents the risk model used in the assessment process.



Risk Model

This risk model presents a management structure that normally provides the overall framework for system under development efforts.

- Business, Project and Infrastructure must come together to be successful.
- In the achievement of the desired goals, each element of the management structure bears the accountability for certain roles and achievements.

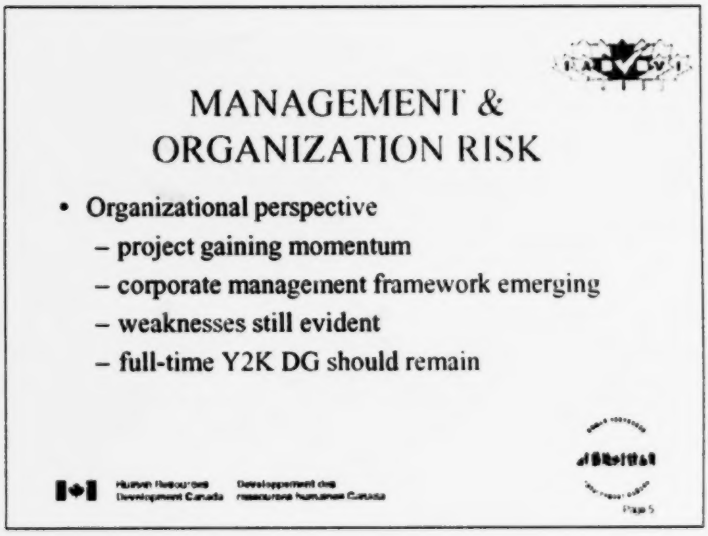

APPROACH
• risk model defines four risk categories
– management & organization risk
– business risk
– project risk (includes testing risk)
– technology risk

Management & Organization Risk - the presence of a well-defined structure of roles, responsibilities and authorities within which the project operates, and within which all major decisions concerning the scope and objectives of the project are made.

Business Risk - clarity and stability of the processes from which system's requirements will be derived, the integrity and robustness of the priorities to address those requirements, and the capacity of the organization to deal with the effort.

Project Risk (including Testing Risk) - the internal organization and management of the project, and to its monitoring, reporting, control and communications functions (considers the tools, techniques, methods and procedures needed to do the actual work of the project).

Technology Risk - the degree of inherent risk in the technology platforms; also the transition of converted applications into the infrastructure within which they will operate.



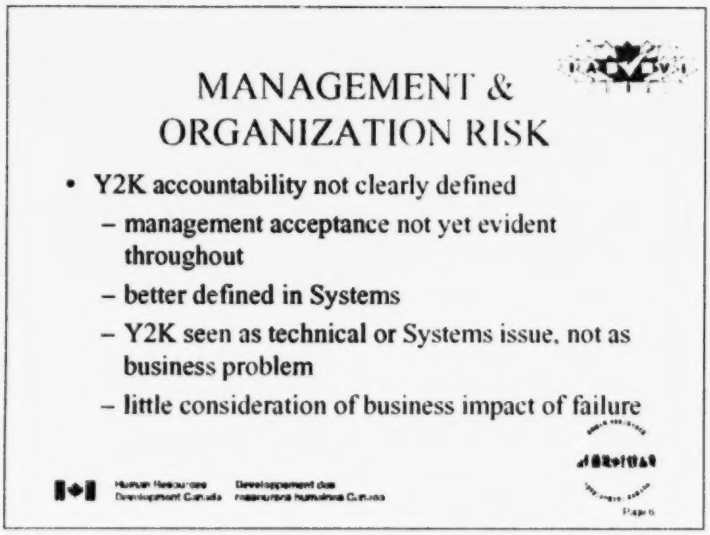
Organizational perspective:

The project is now starting to gain momentum, and the corporate management framework shows evidence of coming together.

- As momentum builds, weaknesses are becoming evident as well.

Y2K now has a full time Director General with no other responsibilities.

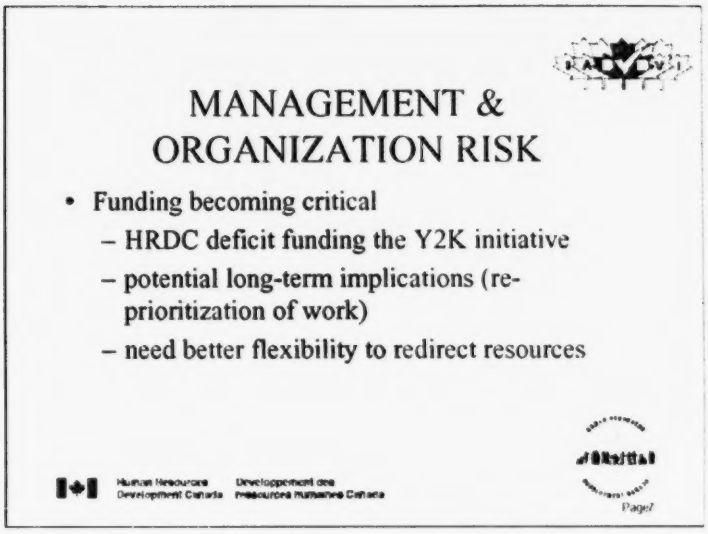
- Based on what is seen outside HRDC, this organization should remain until Y2K is completed; for example, the CIBC has named a Senior Vice President to run its Y2K effort.
- The Project may require assistance at the Director level to run the PO.


MANAGEMENT &
ORGANIZATION RISK
• Y2K accountability not clearly defined
– management acceptance not yet evident throughout
– better defined in Systems
– Y2K seen as technical or Systems issue, not as business problem
– little consideration of business impact of failure

Accountability for Y2K as a corporate priority is not clearly defined. Management acceptance exists formally, but is not yet evident throughout the department.

- Because HRDC works in a collegial manner, clarity of mandate is essential; lack of clarity can lead to lack of commitment.
  - mandates, overall roles & responsibilities not clear to all involved in Y2K.
  - less well defined in the Regions and Program areas.
  - the role of the Project Office has been widely questioned.

- Awareness is growing, but Y2K is still seen as a technology, or Systems, issue - no real consideration of economic or business impact of failure.
  - there is a lack of acceptance of Y2K as the first priority.
  - Program areas have been fighting for non-Y2K priorities, although this has been changing recently.


MANAGEMENT &
ORGANIZATION RISK
• Funding becoming critical
– HRDC deficit funding the Y2K initiative
– potential long-term implications (re-prioritization of work)
– need better flexibility to redirect resources
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Funding is becoming a critical question. Senior HRDC management has decided to promote "risk management" for funding to get the job done.

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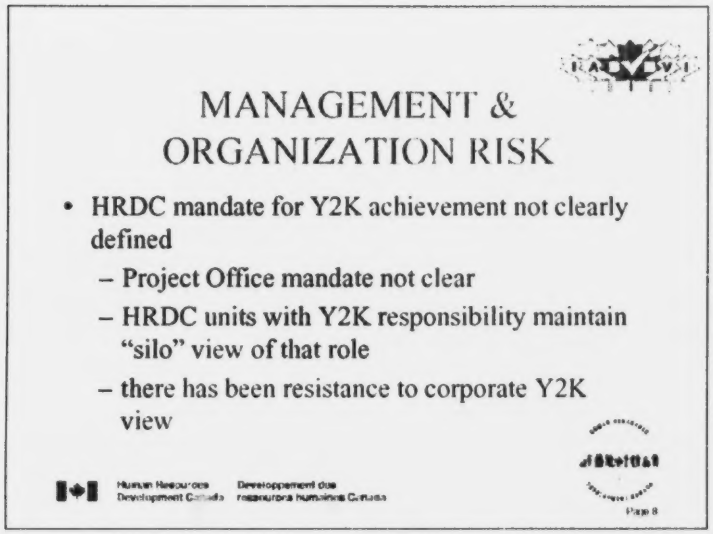
- HRDC is deficit funding Y2K [redacted]

S.69

- Reprioritization is a potential long-term implication of deficit funding. [redacted]

- HRDC needs better flexibility to redirect resources to maintain (and hire, if required) specialized Y2K expertise. For example, Systems development and maintenance is highly dependent on consultants).
  - resources may need redirection within Systems, and between Systems, program areas and regions.
  - loss of consultants now will likely mean an inability to bring them back later.


MANAGEMENT &
ORGANIZATION RISK
• HRDC mandate for Y2K achievement not clearly defined
– Project Office mandate not clear
– HRDC units with Y2K responsibility maintain "silo" view of that role
– there has been resistance to corporate Y2K view
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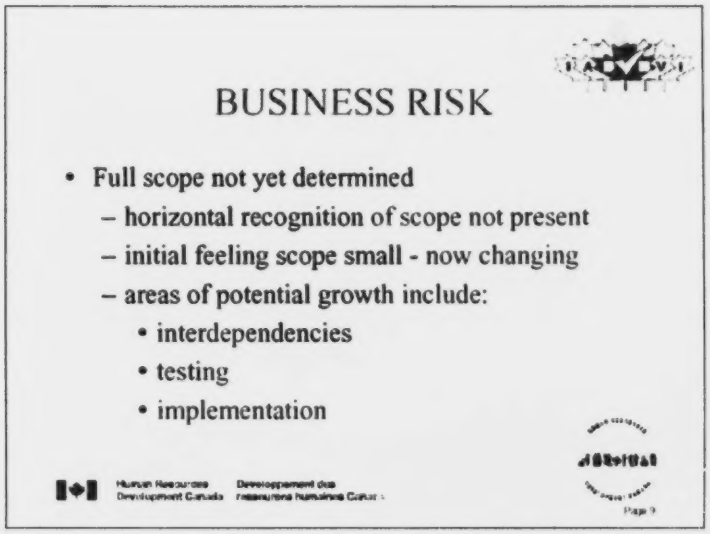
There is a lack of a clear corporate position on Y2K across all jurisdictions. HRDC mandate for Y2K is not clearly defined.

- Project Office Mandate is not clearly defined therefore their role is uncertain. The respective roles of the Project Office, the various Systems organizations and the Program areas remain subject to debate in the Department.

- Responsible areas have a "silo" view of their own business resulting in resistance to the Y2K commitment.
  - leave us alone to do the job, don't add overhead

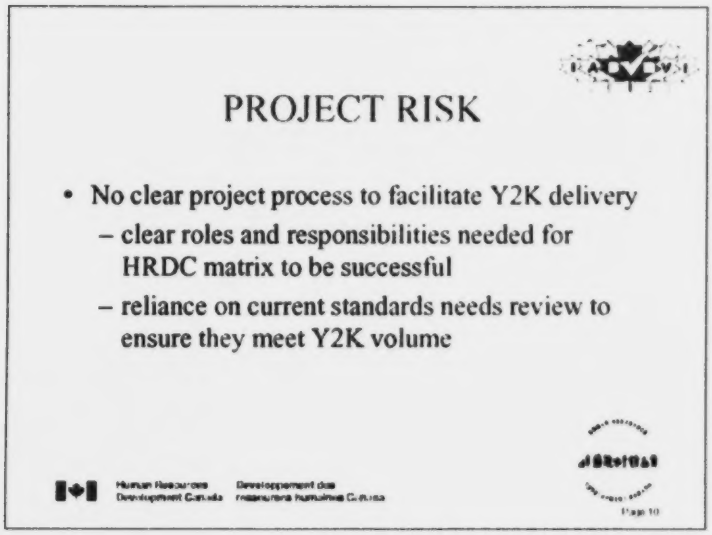
- Professionalism must come to the forefront.
  - corporate team player attitude crucial.


BUSINESS RISK
• Full scope not yet determined
– horizontal recognition of scope not present
– initial feeling scope small - now changing
– areas of potential growth include:
• interdependencies
• testing
• implementation

The scope of some areas still relatively unknown. Initial scope calculations are best guesses and are difficult to prove empirically. Scope management increasingly critical in situations where initial scope cannot be definitively determined.

- Horizontal recognition of the scope of Y2K is not evident at this time.
  - Systems only recognized extent of conversion scope when work started in this area.
  - awareness is now growing in the testing area.

- Interdependencies, testing, implementation, bridging are key scope elements that are yet to be fully defined. Concerns include:
  - the impact of infrastructure changes on testing;
  - the fact that HRDC stovepipes and doesn't easily recognize linkages;
  - timeframes and total workload for implementation have not yet been determined;
  - bridging joins two out-of synch systems or two dissimilar solutions; concern is that inadequate time devoted to this element.

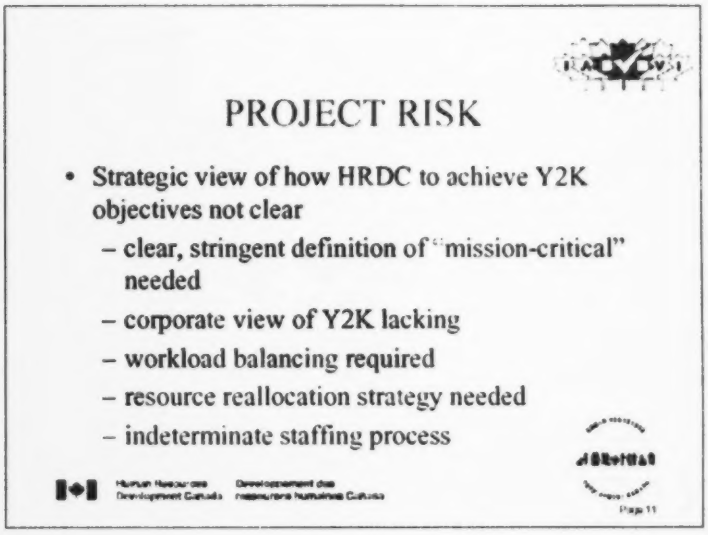

PROJECT RISK
• No clear project process to facilitate Y2K delivery
– clear roles and responsibilities needed for HRDC matrix to be successful
– reliance on current standards needs review to ensure they meet Y2K volume

The broad scope of the Y2K initiative, touching virtually every part of the Department, means that traditional roles are difficult to define. As a result, there is no clear project process to facilitate all aspects of the Y2K delivery.

- The present Systems organization is matrixed.
  - Roles and responsibilities for Y2K need to be clearly defined/understood (including Program Areas and regions) for the matrix to be successful

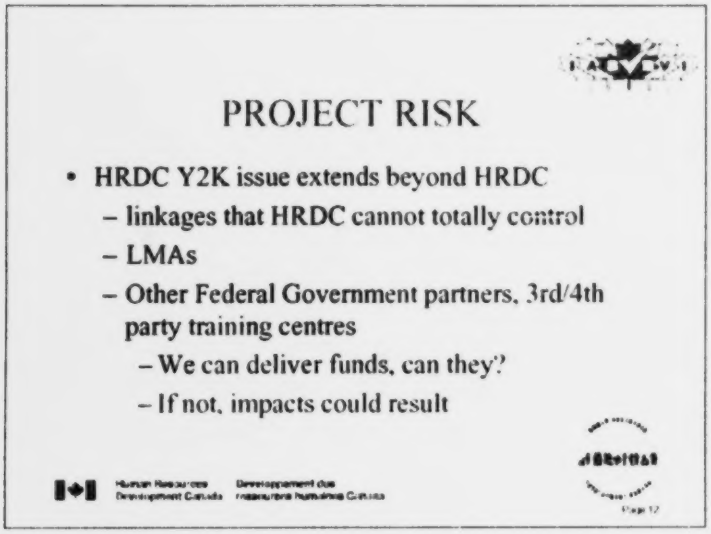
- Vertical communications are relatively good, however horizontal communications are limited or lacking across Systems and the Department.

- Departmental processes should be reviewed, and improved where necessary to handle the Y2K volume.
  - conversion, testing, implementation processes particularly need attention.
  - the testing process is under development now.


PROJECT RISK
• Strategic view of how HRDC to achieve Y2K objectives not clear
– clear, stringent definition of "mission-critical" needed
– corporate view of Y2K lacking
– workload balancing required
– resource reallocation strategy needed
– indeterminate staffing process

A strategic view of how HRDC will achieve Y2K objectives is not clear.

- Clear, stringent definition of "mission critical" needed.
- Corporate view of Y2K must be promulgated (overall picture of goal achievement).
  - Workload balancing - ongoing triage of systems needed based on mission criticality.
  - Resource reallocation strategy is required in support of system design , testing and implementation.
  - failure to meet the indeterminate staffing requirements heightens risk.


PROJECT RISK
• HRDC Y2K issue extends beyond HRDC
– linkages that HRDC cannot totally control
– LMAs
– Other Federal Government partners, 3rd/4th party training centres
– We can deliver funds, can they?
– If not, impacts could result

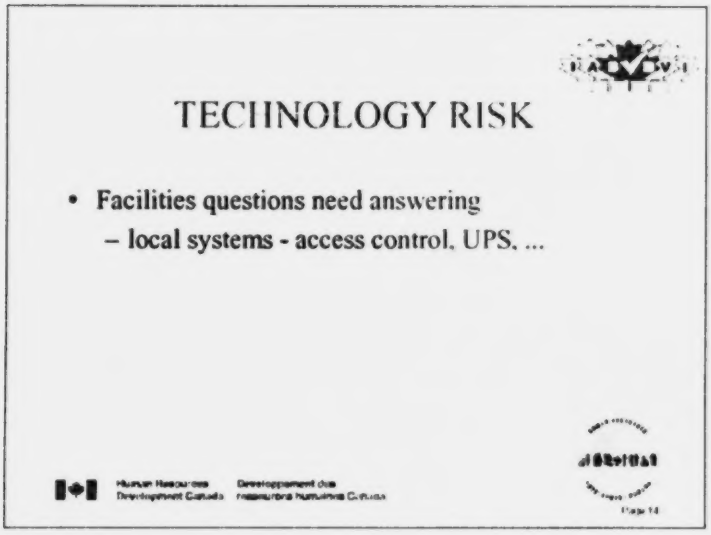
The HRDC Y2K problem extends beyond HRDC.

- Data or system linkages carry a residual level of risk not controlled by HRDC - such as: Training Centers (3rd/4th party); LMAs; other Governmental Partners
  - the inability of partners to meet Y2K objectives must be assessed.

TECHNOLOGY RISK
• Infrastructure readiness will impact overall delivery
– likely to meet general infrastructure readiness
– Banyan a question
– 3rd party vendor compliance high risk

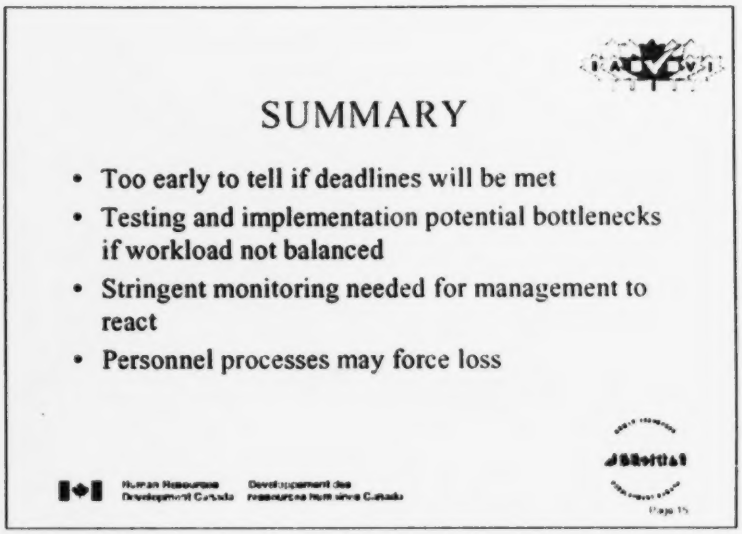
Technical infrastructure readiness will impact overall delivery.

- There remains a good chance that HRDC will meet overall infrastructure readiness.
  - basic infrastructure elements are known and work is underway.
- Communications is a higher risk due to questions on BANYAN readiness.
  - corporate viability in question
  - compliant release not planned until late in the HRDC Y2K timeframe
  - S.20(1)(c) [redacted]
- Third party software and hardware (vendor compliance) high risk due to variety and number of products in use.



Other facilities questions need answering.

- Uninterrupted Power Supply (UPS), Security Access Systems (cards, cameras, record keeping)
-


SUMMARY
• Too early to tell if deadlines will be met
• Testing and implementation potential bottlenecks if workload not balanced
• Stringent monitoring needed for management to react
• Personnel processes may force loss

Summary

- It is too early to tell if target dates can be met

- If workload balancing is not undertaken or is unsuccessful, testing and implementation are the next potential bottlenecks in the process.
  - stringent monitoring is needed to ensure management can react.

- Getting enough experienced resources (testing, implementation, conversion) is a government-wide concern.
  - unsuccessful candidates in the competitive processes could be forced to be re-interviewed to maintain their acting status - may risk losing expertise.
  - competitive process to staff indeterminate positions, whoever does not qualify may leave.
  - federal cutbacks, contract negotiation results, disgruntled employees adds risk

APPENDIX A

RISK ASSESSMENT INTRODUCTION

The results of the risk assessment are presented in the format of a risk matrix in the following appendices. The purpose of the matrix is to identify factors that could affect the success of the project to deliver Year 2000 solutions, on time, within budget, and that meet user requirements. Subsequent audit activity is based on the assessment of risk associated with these factors in each of the four areas: Management and Organizational Risk; Business Risk; Project Risk; and, Technical Risk. Each category of risk has been organized into three columns describing: the related project activity; the audit conclusions and assessment of risk, and areas where improvement would reduce the risk to an acceptable level. Recommendations are specifically titled in each matrix. Other entries in this column can be treated as suggestions.

The risk assessment describes the nature of the threat, the likelihood of it occurring, and the consequences of that threat. The risk assessment is based on the experience of the reviewer. The difference between projects fostered by unique business problems for which a solution is being sought, different business and project organizational approaches, personal project management styles, and different project control and system development methodologies, works against the applicability of a statistically derived assessment methodology. In this review, the following definitions are used:

Low Risk	Reduction of the inherent risk either through a combination of significant project management measures or environmental influences. For example, Project Risk is reduced through the combined application of a recognized development methodology and a project organization that has applied a quality assurance regime and has staffed an experienced team familiar with the business and technology.
Medium Risk	Given that inherent risk is present, the project is taking adequate precautions to manage that risk and no unusual environmental influences are present.
High Risk	Compounding the inherent risk with either the absence of adequate precautions or the presence of unusual environmental influences. For example, Business Risk would be greater due to the absence of a documented comprehensive control framework in the case of a mission critical financial system. Technical Risk would increase with the use of technology with which the organization is not familiar or with dependence on unreleased versions of vendor software or a promised infrastructure.

Risk Assessment Structure

The Risk Assessment, and the resulting matrix report, is organized into the following categories:

Management & Organizational Risk

- Senior Management Control Framework
- Change/Scope Management
- Achievement of Planned Benefits

Business Risk

- Business Requirements Management
- Solution Design
- Management of Change

Project Risk

- Project Organization and Management
- Control Process
- Development Process

Technology/Infrastructure Risk

- Infrastructure Baseline
- Technical Transition

Within each category and sub-section, there are numerous individual measures that are recorded in the following matrix. As some measures are not unique to an individual category, some apparent duplication is intentionally included for readability.

APPENDIX B

RISK MATRIX

B.1 Management Risk

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
B.1.1 Senior Management Control Framework		

Organizing Accountability for Y2K as a corporate priority is not clearly defined.
 	
– Accountability below level of ADM - who is responsible for what, and how to get it done - not clear to all involved.
  – less well defined in regions and program areas than Systems.
  – program staff liaise with regions but not sure what is happening out there.
  – users assume Systems is taking care of Y2K, don't know what role to play
  – each time the Systems story changes, regions are impacted leading to loss of credibility.
  – role of the PO is widely questioned.
 	
– Within Systems, Infrastructure versus Operations - not clear what the roles are.
  – no problem with regional or ITC roles.
  – ITCs actually in dialogue, sharing info about inventories.
	Mandates, overall roles and responsibilities not yet clear to all involved in Y2K.
	
	– Because HRDC works in a collegial manner, clarity of mandate is essential - lack of clarity leads to lack of commitment.
	– There is high risk that senior management will encourage a crisis of confidence if accountability for and acceptance of the Y2K priority does not improve.
		Recommendation:
		
		Senior management should clarify all roles and responsibilities for Y2K delivery across the department in an accountability document.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– Lack of enthusiasm to contribute caused by organizational problems; representation across department not always evident for Y2K. – CSL separate - lack of attendance at regular Y2K meetings (not on mission-critical list, so does not go). – ISP infrastructure responsibility unclear. – Labour 50/50 on their own. – Apps Group 3 often a no show at meetings - no overall representation, coordination. – Operations/Infrastructure attendance not frequent. <u>Leading</u> Average staff cannot relate to Y2K as a corporate issue; no ownership of Y2K outside Systems. – Some senior managers do not understand priority/implications of Y2K related actions. – Strategic Policy gave $2.4M to Systems, when Y2K became top priority they got their $ back to do the work themselves. – reinforces idea that Y2K is a Systems problem. – Insurance Control gave $1.3M to Systems for non-Y2K work they were told would go ahead despite Y2K. – told in Nov this would not happen. – indicates lack of understanding within Systems as well.	Awareness is growing, but Y2K still seen as a technology, or Systems, issue. Management acceptance/commitment exists formally, but not yet evident throughout the department. – Program areas have been fighting for non-Y2K priorities, although this has been changing recently. – Lack of commitment can jeopardize Y2K objectives. – No real consideration of economic or business impact of failure. – No real adherence to Y2K priorities, lack of acceptance of Y2K as first priority. There is a lack of real corporate position on Y2K across all jurisdictions. – Lack of clear mandates and authorities has led to a lack of strategic planning for Y2K.	<u>Recommendation:</u> It is essential that professionalism now come to the fore. Consequently, Senior Management should: – ensure that all management staff understand and accept the Y2K priority. – mandate a higher profile for the Y2K Project Office.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– Y2K not yet the priority across the department, although this is changing; Senior Management support not evident initially, still slow in some areas. – Program areas becoming more aware as result of Project Office communications program. – although they see Y2K as the number 1 priority, they still want non-Y2K changes – Systems must do Y2K as well as business as usual over and above the emergency releases condoned by Senior Management. – HRIB not proceeding with other development until Y2K done – needed several iterations, but awareness in HRIB now good. – Senior management doesn't seem to push middle managers slow to accept the Y2K priority. – often difficult for junior staff to get senior management attention. – maintenance not a well defined term - requests coming through as maintenance.	– Much of Y2K is management and coordination - it is accepted in government that relatively small portion is truly technical. – coordination depends on awareness, acceptance and good will. – Responsible areas have "silo" view of their responsibilities.	– ensure that Y2K as a corporate priority is included as a measured performance indicator for senior review.
<u>Communications</u> Corporate Communications has a national strategy to follow the Y2K project all the way through. – Identifying target audiences, developing different messages. – ensuring public concerns will be addressed. – lots of data offered on Y2K activities and directions. – conference calls, Intranet web site, etc. – masses of data difficult to digest	Communications has been accepted as crucial to the success of the Y2K effort. As a result, considerable level of resources applied to the problem.	

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
B.1.2 Change Management		
Scope Management The scope of some areas still relatively unknown; S.69 – Testing is an area of concern: – underestimated even at senior management levels. – overlap between application testing, Y2K certification, and testing services. – lack of appreciation for the difficulty of integration and linkage testing. – Interdependencies not yet well understood: – number of interdependencies overwhelming. – HRDC stovepipes, doesn't easily recognize linkages. – Implementation being explored now: – timeframes and work required for implementation unknown. – needed so hiring and training can take place. – Bridging largely unexplored to date: – joins 2 out-of-synch systems, or 2 dissimilar Y2K solutions. – as important as testing and less well defined. – investment here backs up inadequate test time estimates.	Initial scope calculations best guesses and difficult to prove empirically. – Scope management increasingly critical in situations where initial scope cannot be determined. – Steps taken earlier to determine scope only for national applications and infrastructure. – Work ongoing in regions on regional and local applications. Initial scope calculations not really formal; no one really knows how big this problem is exactly. – No one yet knows the full extent of the problem. – Only recognized extent of conversion when started to do work. It is recognized that, due to nature of project/issue, it is difficult to measure scope at the outset. – Management should position themselves to re-prioritize as needed. – Refer Business Risk as well.	Recommendation: Senior management should be prepared to re-prioritize Y2K work load as the scope becomes clearer over time.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– Scoping decisions have left some technology owners on their own – clones of Sun machines for example. – Other work cannot be ignored, adding complexity to the environment. – SSA has a high degree of platform dependency; must continue to release new material during the Y2K timeframe. – ISPR being reworked at this time as well.		

B.1.3 Achievement of Planned Benefits

– S.69 – – – , will have immediate and direct impact on Y2K capability. – loss of consultants now likely to mean inability to bring them back later.	S.69 – Reprioritization a potential long-term implication of deficit funding. – Department needs better flexibility to redirect resources to maintain necessary expertise. – Systems very dependent on consultants. – may require redirection within Systems, and between Systems, Program areas and regions.	Recommendation: HRDC needs increased flexibility to redirect resources to maintain specialized Y2K resources. Senior management should initiate a resource re-allocation strategy to address resource needs within Systems, and between Systems, program areas and regions

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– Told to spend what is needed to get the job done. – Y2K team -$3M, AG3 -$1M, Ops -$3M to date – [redacted] S.69 – slow start-up - Systems revised to $27M in September 97 – November estimate reduced this further to $10M. – implies slippage to next financial year.		

B.2 Business Risk

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
B.2.1 Business Requirements Management		
Y2K Inventory Inventory about 95% complete for applications; inventory of 3rd party software up to date. – Senior management has a basic level of confidence that the mission-critical systems have been identified. – lack of visibility and /or profile of applications can lead to lack of adequate consideration. – national apps in regions have low profile; – national apps without identified owner have low profile; – action under way to allocate ownership of "orphan" apps; – micro-based / "internal" apps in the user areas; – e.g., HRIB may have internal apps that the Y2K PO does not know about. – unsupported local apps in the regions; – estimate of 400 more apps over and above 260 national apps – Immigration apps - unsure about requirements here; – Y2K Oracle inventory application/database proceeding slowly – project not seen as priority – product module will only include software – testing module is dependent on the product	Overall inventory now seen as successful, but the processes to determine the requirements and identify linkages and interdependencies are only now being developed. – Hence scope is not yet fully determined. sic inventory is OK, but may need a more effective tool to keep inventory up to date – Lack of visibility and /or profile of applications can lead to lack of adequate consideration. – Lack of acceptance of Y2K as a business issue has hampered the recognition of the scope and repair effort Medium risk that incomplete scope determination will skip some significant elements of the full slate of Y2K requirements and jeapardize the implementation of effective solutions.	It is suggested that the Inventory data base application be given a higher priority.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
module, – difficulties getting information for vendors and linkages modules (expected completion Feb/98).		
Y2K Priority Lack of acceptance of Y2K as a business issue has hampered the recognition of the scope and repair effort – There is general acceptance of the mission critical applications as defined at the national level; – consultant defined mission critical applications. – classification of mission-criticality key to prioritization – 77 mission-critical apps out of 260 national apps, or 1 in 3 apps. – examined 18M lines of code using SEEC - an automated tool. – 10M lines of code deemed non-compliant. – prioritization process evolving within HRDC's complex business environment – Impact of failure is minimized in program areas, where acceptance of ownership and priority of Y2k has been resisted: – assumes that Systems is taking care of Y2K – seen as a technology problem wherever systems used are not mission critical – Y2K risks seen as vastly over-rated – Y2k delays other key business priorities – Y2K defers ISP redesign – U.I. Re-engineering, has been 'put on the	Recognition of the scope of the Y2K problem slowed by: – a yet incomplete baseline due to the large number of applications, – evolving processes for priority-setting – a failure to generate buy-in of Y2K as the key business risk Mission criticality concept stable but not well understood top to bottom in HRDC. – Differences in opinion can result in lack of acceptance of Y2K priorities. – Project managers likely to have different opinions about their project than Y2K Project Office.	Recommendation: Senior management should clearly define and propagate a stringent definition of "mission-criticality".

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
back burner' – Y2K seen as date change only -- a maintenance procedure-- not a new requirement. – Effort to repair may be increased by Systems reinforcing the cultural perception of Y2K as 'Systems problem' – Systems may have taken on too much responsibility to do it invisibly to users. – Internal publications (e.g. ZOOM, Periscope) may leave impression that Y2K is moving along well and primarily a Systems issue – hence no ownership of Y2K outside of Systems – Requirement exists for some valid, nonY2K continuing priorities – EI Leg implementation until 99. – SSA releases before Xmas		
<u>Environmental Complexity</u> A highly complex application environment, technical infrastructure and vendor issues makes linkages and interdependencies key scope elements – Application environment is complex due to application size and transaction volume. – big, often interrelated systems. – lots of different technology. – long development/evolution time frame; only certain people can deal with these systems. – e.g., ISP most complex; 25 years old but in good shape.	Challenge will be linkages between apps, lack of documentation of apps: – vendor compliance not well understood by senior management.	It is suggested that a monitoring mechanism be initiated to review the process of identifying and addressing linkages, interdependencies and the impact on Y2K timeframes and resources.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS

- not on the same platform
  - hence require a large variety of skills.
- network supports 230 national applications
- techniques to fix vary with applications:
  - Using windowing in OAS
  - CPP Benefits, using a 4 digit year
  - Appli-Sys and SSA: Bridge in the field filters 2 digit back
    - Bridge will be removed afterwards
  - ISP using windowing for some

- Heterogeneous infrastructure adds complexity.
  - client/server a corporate platform, but new to Systems.
  - variety of combinations supported.
    - e.g., UNISYS, IBM and client/server
    - however, applications tend to not cross platforms
  - national network runs through about 560 routers
  - three main users of UNIX and NT are Oracle (database), DNS (supplier of firewalls) and Internet/Intranet.
    - Oracle in turn supports a vast number of applications
    - Including development, testing and production, there are over 100 databases
  - 90% of machines are not Y2k compliant but 80%

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS

could handle Y2k dates

- Sun and HP have Y2K compliant software being tested now
- DEC software to be out by December/97

- Vendor management processes still developing
  - HRDC seen as having poor relations with vendors.
  - PO not mandated to deal with vendor assessment.
  - dependent on vendors, vendor survival key to Y2K.
    - what happens when suppliers cannot supply ?
    - dropping the product -, [redacted],
    - viability of a company ([redacted]), S.20(1)(c)
    - high usage of third party products (Novell).

B.2.2 Solution Design

Re-prioritization Lack of attention to balancing $ invested against actual Y2K delivery deadlines.

- $ investment out of the control of the project team.
  - there was no serious challenge to Systems numbers
  - staff told to re-deploy existing $.
    - moving necessary resources around to meet other Y2K priorities.

Impact analysis now seen as necessary in order to ensure prioritization for balancing cost and delivery.

- Reprioritization becomes necessary as time and cost parameters vary.

Priority-setting process for balancing time and cost impacts not initiated early enough.

Recommendation:

Business areas will need to undertake a re-assessment of their Y2K priorities when required by pressures on timeframes or available budgets.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– expecting to be repaid from Y2K funds down the line – no Y2K budgets available initially. – comes from own budget. Charges are coded to a Y2K financial code – running a deficit during audit time frame – Y2K expenditures have included: – buy tools to help efficiency – set up a special section for testing for Y2K for software. – $100K spent in setting up a test environment for certification process. – $1K/day for consultant for 6 months. – Y2K effort insulated into individual application chunks: little recognition of benefits of combining efforts for testing, bridging and linkages – HRDC undertaking Business Impact Analysis for prioritization. – perhaps too late - the scope decisions have been made. – At TB's request, HRDC prepared 'worst case scenario' for each program area (Employment & Insurance, ISP, and Labour) – bring to light some very negative consequences if Y2K objectives are not met; – support the need to ensure HRDC properly addresses Y2K.	– Initial priorities set by concentrating on mission-critical applications and related hardware/software. – Some form of triage needed on applications for re-prioritizing. – Criticality ratings may need to be revisited	

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS

B.2.3 Management of Change

Some changes to come but not usually seen as significant; minor opinion to the contrary.

- There may be an overall impact on response time due to large scale changes to old code and data structures.
  - Most apps will utilize date expansion -- resource intensive process, especially on testing and implementation
  - infrastructure change can be troublesome - like moving to Windows95.
  - new CSL will see some impact on users - already started.
    - decision support to program users resulted in new case management function.
    - program help desk went from 3 people to 12.
    - new CSL will have GUI interface, Windows 95 environment.
    - will require training.
  - Project Office preliminary risk assessment calls for
    - in-depth review of the CMS project, for business-related risks
    - tracking of key issues for SSA and CMS, for application-related risks

Concrete deadlines, limited $, biggest effort in recent years.

- may need to have more active management of the whole effort
- resource impacts on business user areas seen as troublesome, but temporary.

B.3 Project Risk

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
B.3.1 Project Organization & Management		

Organization & Management The present Systems organization is matrixed. The Y2K project structure started small and has been evolving.
 	
– There has not been a day-to-day project leader with widely communicated authority.
  – Project DG just recently available full time to Y2K.
  – Respective roles of GMC and PO in decision making not yet clear.
  – e.g. the organizational level that will sign off on vendor compliance has not been identified.
  – actions on the Y2K problem dependent on the respective DGs within Systems.
 	
– The PO perceived as being too small for the workload.
  – no back-up for key positions; no succession planning.
  – current flat organization may not be most effective - team structure.
  – some opinions in Systems that it lacks sufficient technical expertise.
  – lack of defined procedures & systematic documentation of decisions in PO.
	The broad scope of the Y2K initiative, touching virtually every part of the Department, means that traditional roles are difficult to define. There is a lack of clear focus for project-level decision making.
	
	– Roles and responsibilities for Y2K need to be clearly defined/understood (including Program areas and regions) for the matrix to be successful.
	
	– The present organization of the PO may not be appropriate for current needs.
	
	– There is a low risk of info not being appropriately shared within the PO.
	
	– There is a medium risk that inadequacies in the planning and coordination of the Y2K project will be adversely affected by the lack of a strong role of the PCC.
		Recommendation:
		
		Senior management should ensure that the Y2K project structure is revised to enable it to maximize its contribution to the solution of the Y2K problem.
		
		Senior management should consider:
		– ensuring that a full-time project leader is maintained, and that the precise authority of this project leader is widely communicated to all stakeholders.
		– expanding the Project Office to ensure that it is appropriate for the workload, and has sufficient depth of key resources to provide redundancy.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– Information reasonably good within the PO team. – somewhat lax on documentation - example, on SUDs teams pay a lot more attention to decisions. – lack of defined procedures, structure. – The Project Coordination Committee not seen as fully effective. – interaction not great, seen as place to avoid. – Project team meets often without DG.		The Project Director General should review the PO organization structure with a view to determining if the current flat structure continues to be the most effective. <u>Recommendation:</u> Senior management should clarify and widely communicate the role of the PCC.
<u>Project Office</u> Most of the work in Y2K is to be done outside the Project Office - the organization is ad hoc to that extent. – The PO has no clear mandate. – PO staff see their role as coordinating, communicating, monitoring and reporting, but as also including a mandate to provide direction on certain issues. – In the rest of Systems there is a variety of viewpoints on the role of the PO. – some indicated that the PO is playing an appropriate role as being coordinating, communicating and monitoring, and not directing.	The respective roles of the Project Office, of the various Systems areas, and of the Program areas remain undefined and subject to debate in the department. The roles of the Project Office and of other participants in Y2K continue to be misunderstood. – high risk that the lack of a clearly communicated and widely accepted understanding of the PO's role will adversely affect the ability of the Department to make all of its systems compliant within established deadlines.	<u>Recommendation:</u> Senior management should ensure that the role of the PO is clarified and widely communicated.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– a few believed that the PO is not useful or appropriate, and even questioned the need for a PO. – the PO role in horizontal testing was questioned given that Systems Services and the AGs already have testing staff. – others saw a need for greater attention to be paid in HRDC to horizontal issues. – some views that PO should be doing more coordinating. the role of Operations vis-à-vis Implementation Services said to be unclear. – some views that PO should involve more people from Systems in decisions/ proposals/plans: e.g. PO came out with testing guidelines but didn't draw on existing HRDC testing policy. – the roles of the various Systems areas in Y2K are undefined.		
The Project Charter is out of date and was never signed off or widely circulated. – identifies ADM Systems as Project Sponsor although HRDC has been promoting the view of Y2K as a business problem. – inconsistency: Charter states the Project DG has "full authority" over the HRDC Y2K Project, but also acts as a catalyst and a facilitator. – does not specify roles in Y2K of the various Systems areas outside of the PO. – does not specify roles in Y2K of the Program areas.	The lack of a current Project Charter is a contributing factor to the lack of clarity of roles. The preparation of a new Charter may not be an effective use of time at this point in the Y2K project; however, a statement of the roles and responsibilities of all stakeholders in the Y2K project would be useful. – extent of authority of the PO is unclear. – medium risk of a "silo" approach in the Department to the Y2K challenge. – lack of clear and widely-communicated authority of the PO may hamper efforts to ensure effective coordination of testing, bridging and implementation.	<u>Recommendation:</u> Senior management should ensure that a statement of all stakeholders' roles and responsibilities in the Y2K project is approved and promulgated.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– PO staff feel it lacks sufficient authority. – PO cannot enforce compliance with its decisions or requests for information & must devote time to persuasion. – some opinions in PO that it should report to ADM Systems to ensure things get done. The Y2K Coordinating Committees in Systems are functioning reasonably well. – AG1 & AG2 have frequent Y2K meetings, and each attend the other's meetings. – a PO rep attends the meetings of AG1 and AG2. – no Y2K coordinating committee in AG3 , and insufficient communication to PO on their Y2K activities/progress.		
<u>Communications</u> Communications from the PO to Systems and the regions seen as working by the PO staff. – Intranet site for Y2K throughout the department a good tool. – 30K hits as of September. – there is so much on the site that it is difficult to scan it all for changes. – some views in Systems that PO is building new mechanisms when existing communication channels can be used more. – mixed opinions on adequacy of communications from PO to outside the project.	Communications in vertical directions are relatively good regarding the project (both within the project itself, and outside). However, despite various useful mechanisms for horizontal communications, the latter show evidence of some weaknesses. – Misunderstandings still prevail about the extent of Y2K, the impact Y2K is expected to have on ongoing work, and the relative roles concerning Y2K. – Insufficient communication by AG3 to PO on Y2K increases the level of uncertainty regarding the project.	<u>Recommendation:</u> Project management should ensure that mechanisms for horizontal communications are in place and utilized

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– some views that PO should provide simple status reports regularly on HRDC's progress on Y2K overall e.g. on the HRDC inventory; status reports on testing. – Implementation Services feels that PO and Implementation Services have been asking for the same information from regions; PO should be getting the information from IS. – some views that PO expected to be better informed; can only get about 30% of the information expected. – PO staff believe that there is insufficient communications inwards towards the PO. – reports from regions provided regularly to Y2K team. – HRIB "Weekly Activity Report" outlines work in process and progress to date including Y2K. – communications excellent within the PO. A number of concerns were expressed regarding horizontal communications. – A lot of information is being sent out, but it is not prioritized and people do not have the time to read through it. – Insurance Control gave $1.3M to Systems for non-Y2K work they were told would go ahead despite Y2K - told in November this would not happen. – Confusion over test roles led to this situation. Have asked	– Vertical communications channels are open, but not everyone avails themselves of the content. Horizontal communications are seen as inadequate; there are some concerns that there are insufficient communications to the Program areas, and thus insufficient buy-in to the problem.	

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
for their $ back, but it may have already been spent. Indicates lack of understanding within Systems as well. The PO has a good team but the structure is thin. Many interviewees reported that the PO team is working hard. – The PO's technical competency has been questioned. – Due to government process the lead time to staff is 6 months. – big learning curve for consultants on legacy systems. – over-reliance on some key staff. – risk of loss of staff to higher paying employers. – Treasury Board unrealistic in not recognizing the $ needed to retain CS staff.	The availability of skill sets to meet the Y2K priority is a concern across the department due to conflicting priorities and the scarcity of these skills. The perception of inadequate technical competency in the PO is affecting its credibility.	The perception of inadequate technical competency may also be addressed by the clarification of roles. <u>Recommendation:</u> Project management should ensure that the PO has sufficient technical skills to fulfill its roles.
B.3.2 Control Process		
<u>Planning</u> HRDC lacks a departmental plan that includes a critical path. – Y2K Project Plan (dated December 11/97) lacks much information: of 134 systems listed 32 systems were lacking their dates. – about 80% of mission critical systems conversion plans are available.	Control established to a basic level - but areas of concern include all primary control points of project management. Corporate view of Y2K must be promulgated (overall picture of goal achievement). Workload balancing: ongoing triage of systems needed based on mission-criticality. Resource reallocation strategy is required in support of system design, testing and implementation.	<u>Recommendation:</u> Senior management should ensure that an appropriate level of effort is devoted to the preparation of individual Y2K plans in Systems, and the preparation of a
– one page reporting done before, but lack of	– The risk that the Department's mission-critical systems	departmental plan with the critical path based on the

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
standardization meant every report different. – overall, HRDC lacks information to estimate Y2K certification completion. – Estimates based on the available limited information are that all systems won't be done by December 1998; but mainframe applications may be. – A departmental plan cannot be developed until the Systems areas have developed their individual plans. – the Systems areas are developing their individual plans. By December/97 the PO should have received many more key deadline dates from the Systems areas. – the degree of development by the Systems groups of Y2K plans varies. Some groups report they have developed their plans, others were working on them through November. – existing applications plans are aimed at March 98 delivery of applications to Y2K certification testing. If this is not achieved, it will impact the entire delivery schedule. – AG1 already forecasting conversion of some apps after March 98. AG2 has a tentative plan in process of consolidation. AG3 has individual plans. – only since September has the PO been getting useful planning information from Systems. – each Systems area is focused mainly on its own needs, with little consideration yet of linkages, interdependencies and the critical path. – example - some applications will be delayed if	will not be compliant on time cannot yet be estimated because of the lack of a departmental plan that includes a critical path. – The lack of completed plans for individual systems is hampering the development of an overall Departmental plan.	individual plans.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
Infrastructure (platforms) not ready in time.		
A real manual contingency plan for each app is lacking. – no contingency plan for Beyond Mail. – some views that contingency planning is where the program areas should take the lead. – one view expressed that department needs a business impact analysis to know the resulting impact should systems fail, and assist in senior-level decision making and system triage.	There is a major risk that current contingency plans will be inadequate in the event of failure of a major system, leading to a possible inability on the part of HRDC to deliver some of its core services. It is recognized that this is a very difficult activity to complete, however it is also essential.	Recommendation: Senior management should ensure that manual contingency plans for mission-critical system are prepared and thereafter revised based on periodic re-assessment of the following: – the estimated chance of failure of each system; and, – the estimated impact of that failure in terms of HRDC's core services.
There are perceptions that too much time has been spent on the budgeting process; it is felt that cost does not matter at least for mission-critical systems. All the costs will only be known after the fact. – Lack of standards for expenditure reporting. – Systems groups generally don't yet have a person-month estimate for Y2K. – much of the cost for Y2K is internal, but no departmental time reporting. – codes set up for Y2K reporting in June/97 - as of end	There is a lack of standardization for the expenditure process, but maintenance of cost information is crucial. The lack of standards for expenditure reporting makes the reported information less useful. The lack of a person-month estimate for the Y2K work means that it is difficult to estimate the extent of delays to non-Y2K work, and the resulting impact on Program areas.	It is suggested that standard budgetary expenditure reporting processes be adopted for use concerning Y2K work activities.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
Sept/97 S2M reported spent of [redacted]		
Problem Tracking Although there is a problem tracking process partially in place, there is a lack of a mechanism to identify responsibility for addressing the problems. – There is a problem tracking process for Application Groups 1, 2, Infrastructure and services - not yet (as of Oct 23) for AG3. – action items are being recognized. – hot items are reported to ADM Systems. – Issue papers are tabled at PCC. – problem tracking -Project DG reports the issues weekly to management. – there is a lack of a process to register and control issues, and to identify who is to address each issue. – in November exception reporting to be put in place.	Although issue/problems are identified, there is no system to identify who is to address each problem. Resolution of each item not always clear.	Recommendation: Project management should ensure that a mechanism is put into place to identify responsibility for addressing identified problems.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
Progress Reporting Progress reporting is not formalized. As a result of weaknesses in communications, some opinions were expressed that the PO, and thus the Project DG, has not been receiving the full range of information necessary to report on progress. – There are also some opinions that there is a need for more periodic & standardized briefings to senior management. – need periodic and standard briefings to executives. – simpler, more regular reports needed - e.g. is department's inventory finished yet?	The effectiveness of progress reporting regarding the Y2K project presents a medium risk. It may be questionable whether the Project DG gets enough information on progress to be able to report upward fully.	It is suggested that a process for standard briefings to senior management on progress on Y2K would be beneficial.
B.3.3 Development Process		
Y2K Process The volume of work will be high, and it is unclear if the existing process can handle it. – There is a lack of a standard definition for compliance, and a lack of a process to determine compliance with the definition. – need a standard compliance process: Labour and ISP seem to have their own processes. – e.g. Labour declared compliant without testing. – HRDC avoiding unusual conversion approaches. – project lacks defined processes, structures or framework, & is low on documentation. But processes starting to fall into place. – inter-departmental linkages are a big challenge e.g. with Revenue, CPP. – Although progress has been made on developing an	HRDC process to address departmental goals for Y2K is not clear, not similar enough to standard development processes to apply directly, and under development as work progresses. – The inventories of both hardware and software at NHQ and at the regions remain incomplete and thus present a risk that some elements of the systems or infrastructure will not be made compliant. – There is a risk that several regions are trying to solve the same problems independently. – There is a high risk that the project schedule, which is incomplete, will not provide a reliable indication of whether the Department will meet its Y2K deadline. – There is a risk that the current lack of common tools and approaches to conversion will make it more difficult to	Recommendation: Senior management should review and modify as necessary the departmental process for meeting the Y2K challenge. – ensure inventory is complete. – monitor schedule. – increase level of coordination to maximize use of common tools and approaches.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
inventory, the inventories of both hardware and software at NHQ and at the regions remain incomplete. – at NHQ hardware & software inventories are problems: there is a list of orphan products; meetings on this are to be held with ISP & Labour. – low profile for national apps in regions and national apps without identified owner. – regional developed applications that are related to mission critical or national applications are of concern (approx. 247). – regions defensive about NHQ knowing what they have (e.g. PO does not know how many regions have NT SQL server). – The schedule itself, and the process related to the schedule, are concerns. – no changes to process - but again the high volume may cause problems. – the declared schedule is not the whole story. – emergency releases, retesting, re-releases will impact on that schedule. – regions still unaware of the volume of work to expect. – waiting as of November for implementation weekend schedule, and until received can only do limited planning. – need formal release mechanism to ensure all Y2K done. – if dates not met, what is the impact to the rest of the schedule.	ensure linkages between systems can be achieved efficiently. Inefficiency will have an adverse impact on scheduling. Departmental processes need to be reviewed and improved where necessary to handle the Y2K volume. Conversion, testing and implementation processes particularly need attention. The testing process is under development now.	

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– need penalty for those who don't make their schedule. – There is a lack of common tools and approaches to conversion. – conversion is being done in each AG in a silo approach. – each group is doing its own thing. – each group should do own thing with facilitation by PO. – SEEC output can provide information on where line of code with date exists, how the date is used, date format, priority of date code, etc., but the capability is not being used yet. – the means by which the work will be coordinated once the converted apps are provided by the AGs remains unclear.		
<u>Testing and Implementation</u> It is perceived that there is a great deal of work ahead for the testing and implementation processes. – The size of implementation seen as very large given the concrete timeframe. – finding qualified people to do the work is a concern. – burnout a real risk to staff. – There is a major risk that the testing process will be a significant bottleneck. – the findings and conclusions regarding testing are described fully in the section on Testing.	The testing and implementation phases are recognized as the chief risks to the Department meeting its deadlines. – See the section on Testing (below) for further discussion of the Testing risks. There is a high risk stemming from the lack of a reliable estimate of the time and resources needed to effect the necessary bridging of systems. This has an unknown potential to be a bottleneck in the overall process. – Implementation universally seen as an impending risk that could halt the entire process.	<u>Recommendation:</u> Project management should emphasize the testing and implemen-tation phases in its planning.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– the strategy, roles and responsibilities are not yet well developed concerning testing - especially the mandate of the Y2K PO. – test process not yet well developed for applications. – overall schedule for testing and implementation indicates a potential bottle neck - coordination of applications and infrastructure a potential risk. – Bridging is not well understood. – the assessment of the need for resources and time to permit bridging of systems is not well advanced. – The timeframe for implementation is very short. – concern over the amount of weekends available for regional implementation prior to Y2K - all weekends are booked between now and project deadline for regular production. – implementation/roll-out could be a bottleneck due to competing products because of the number of Y2K activities. – Implementation is working on a conversion & production startup plan, and an implementation strategy & plan. – draft schedule for both non-Y2K and Y2K implementations has only 2 weekends free, yet still lacks regional systems, LMAs, Infrastructure, power shutdown, & bridging. A lot of components still to be added to schedule. No slack in schedule and no cushion for problems/delays. – risk to Operations that the needs of the ITCs not yet known because the implementation schedule not yet firm.	– Data or system linkages carry a residual level of risk not controlled by HRDC such as Training centres (3rd/4th party); LMAs; other governmental partners. The inability of partners to meet Y2K objectives must assessed.	

B.4 Testing Risk

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS

B.4.1 Strategy
 	
A strategy for testing is under development; the roles are not yet well developed.
 	
– Each apps group, hardware group, software group and region is doing own testing, but relying on Y2K test group in Systems Services (SS) for Y2K certification.
  – AGs were not told early enough that substantial testing to be done by them.
  – the need for AG2 to create baseline data, test plan, utility programs, WFLS, and documentation for testing was not communicated properly to AG2.
  – AG2 transferred S2M to the test group in belief that SS would fully handle testing, now is in the red by about that much.
  – Insurance Control thought SS test group was to do all Y2K testing, but found out recently that Control Group would do usual testing process. Had to shift resources to Y2K and away from other Insurance tasks.
 	
– SS will do bulk of app testing and a lot of system testing for Y2K. Seem well organized. SS test group has a good approach.
  – roles & responsibilities are well defined within Systems Services.
	The strategy, roles and responsibilities are not yet well developed for the testing phase - especially the mandate of the Y2K PO.
	
	– As a result, the risk that testing will not be accomplished efficiently and effectively is heightened.
	– High risk that some vendor's products will not be sufficiently tested in a timely manner.
	– There is a risk that all non-operations owners may not be aware of their role in testing.
		Recommendation:
		
		Project management should ensure that the strategies, roles and responsibilities for testing are clarified and widely communicated.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– unclear division of responsibility between SSA testing and Y2K testing: SSA says the latter wants them to tell it what to test and to create the baseline. – some AG staff feel the SS test group doesn't have the knowledge of the applications to do the testing properly - maybe AGs should be doing the testing. – Responsibilities for testing vendors' products are unclear. – The Office Automation group's role is uncertain. – MS a corporate standard but not licensed corporately. – will not test Corel package despite fact that regions have it. – Mid-range hardware test role falls to owner. – Infrastructure will test software for Operations only. – non-Operations owners on their own.		
B.4.2 Test Process In addition to Systems Services, about 10 other groups will do their own testing. – ISP, Labour, regions, ITCs, Office Automation, IT Infrastructure, and even some local applications will do own testing. – some of these groups are not organized as well as SS's.	The test process is not yet well developed for applications, which may increase the chances of bottlenecks. – The test process is under development but not yet at an advanced stage, causing a risk that the test process will be insufficient.	It can be expected that the test risk will decrease naturally over time. <u>Recommendation:</u> The Project Office should coordinate the development of a test process which involves all of the participants.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS

- they may not use same methodologies (standards and procedures) for testing. And they may not all have enough resources and thus may come to SS's test group and overload it.
- NESS testers not comfortable with developing test plans.
- little knowledge from AG3 is causing a reduced comfort level.
- AG2 sees lack of organization of testing process and lack of need for SS's test group.

- The test process is still under development.
  - SSA feels there has been too many releases followed by an emergency release in the past years
    - Gradually SS buying in to idea of need to test in real environment as final step.
  - guidelines (about 13) are being drafted by horizontal testing committee for approval of GMC in Nov-December.
    - variety of tools used, using standard testing tools. Not well coordinated.
      - if development people don't build in the tool, SS test group cannot use it.
    - document released on how to test workstations and servers.
      - certification process has been identified.
      - deemed compliant
      - compliant ready
      - compliant certified.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
Test discipline appears to be adequately addressed. – testing depth & structure adequate. – problem reporting - both AG1&2 report on progress. Bug Reporting System used to track test failures. – problem correction process is in place. – for Infrastructure testing HRDC has to test vendors' claims. Issues include the timing of vendors' readiness; how to test Win95 and Office; who'll test the many orphan products.	There appears to be a low level of risk pertaining to test discipline.	
It is questionable if integration testing has received sufficient attention. – only way to do integration testing is to have "live site" testing. – need HRCC clone, not just best guess.	There is a risk of unforeseen problems during the integration testing phase.	It is suggested that more attention be paid to integration testing.
B.4.3 Certification and Accreditation		
A certification process has been identified, but the criteria for compliance, and the responsibility for sign-off, remain unclear. – a certification process has been identified (Systems Services). Programs, app groups, and SS will all be responsible for certification. – there is a process in place to review vendors' responses.	There is a risk of delays during the testing phase stemming from a lack of clear criteria for compliance and from unclear roles. – There is a risk that some systems presently thought to be compliant will be found later to not be compliant.	Recommendation: Project management should ensure that the criteria for compliance and the accompanying roles and responsibilities are clarified and widely communicated.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– one problem is the lack of identified responsibility for sign-off of vendors' products. Project DG or director of the applicable area. Inappropriate for a CS-3 or lower to do. – lack of criteria for compliance within HRDC. – risk that some "deemed compliant" apps not compliant: e.g. Apps 2: claimed O/P system compliant but failed test. – no clear delineation on when you have to retest if there is a new release of operating system software, or hardware.		
Plans for testing were still under development at the time of the review. – The risk of bottlenecks in testing is reason for creation of Systems Services Y2K Schedule (test plan). SS cannot assess the risk of bottlenecks until SS is provided by the Systems groups with their dates. – No solid testing schedules although they are critical for implementation. – SS Test Plan lists 134 systems with their compliancy status but 32 systems were lacking their dates (as of December 11). – Resource estimating is not easy to do for testing. Availability of testers is a big issue. – Scope of testing unanticipated.	Overall schedule for testing and implementation indicates a high risk of potential bottlenecks - coordination of applications and infrastructure a potential risk. – High risk that there will be unexpected needs for retesting.	<u>Recommendation:</u> Project management should ensure that slack is built into the testing schedule to allow time for unexpected needs for testing. – To minimize chances of bottlenecks, the PO should, with the assistance of Systems Services and the Application Groups, develop, a cricitcal path for the testing phase.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
Bottlenecks in the testing process may arise from a variety of sources. – Operations needs to know a schedule and level of demand; concerned that there'll be a lot of demand all at once for mainframe machines in regions on weekends. – There is a risk that some apps will need to be retested because Infrastructure won't be ready before some apps e.g. Banyan. – Integration testing seen as a big risk area. – ITCs unclear on what they do if there is a failure on a weekend: because so many weekends are already booked, they can't easily move it to the next weekend. – A big risk will be the squeeze on testing when retesting occurs. If Infrastructure has problems the squeeze will be tighter.		

B.4.4 Test Environment
 	
Arrangements for test environments at all levels, mainframe, mid-range and client-server (LAN/Wan), appear adequate.
 	
– A mainframe test environment has been set up in Montreal: A16 moved from Ottawa to Montreal, & received letter from UNISYS that it is compliant.
  – 95-99% sure of its compliancy.
  – may be able to use UNISYS test facility A16 in Fredericton if necessary.
  – Unix platform and testing plans being reviewed.
  – High risk of retesting due to continuing changes in testing platforms.
	The test environment is in good shape, although there is a high risk of re-testing due to continuing changes in testing platform.	

B.5 Technology Risk

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
B.5.1 Infrastructure		

Basic Infrastructure Requirements seem to be known and understood.
 	
– 90% of machines not compliant, but 80% could handle the Y2K dates.
  – 25K workstations involved.
  – 10K 486's bought in 95 are not compliant, but could be made compliant.
  – would take 5 minutes each to tune BIOS.
  – 5K would be throwaways - part of the normal, scheduled replacement cost.
  – there may be re-deployed PCs that are not inventoried yet.
  – servers would roll over on Jan 1/2000, but workstations would need BIOS changed at log-in Jan 1, Feb 28, Feb 29, etc.
  – testing coordinated in group, but no dedicated resources.
  – no plan for resourcing, hard to find qualified resources.
  – testing of workstations ongoing now.
  – regions estimates they need $40M for new machines.
	Basic infrastructure requirements seem to be known (generally inventory seen as complete), and work to address Y2K compliancy is under way in support of mission critical applications.
	
	– Some vagueness remains, but generally activity is evident in all areas.
	– Good chance HRDC will meet overall infrastrcuture readiness deadlines.
	– Communications a higher risk (see below).
		It is suggested that management continue to monitor infrastructure readiness.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– Mainframe capacity planning impacts of Y2K not yet done - waiting for definitive implementation schedule. – Operations to monitor the requirements of the platform. – ready to staff 7/24 as the need arises. – ITCs taking it seriously. – moving it along; some sites further along than others. – IBM mainframe not included. – Infrastructure group does not include Labour or ISP.		
– UNIX operating system is being tested in three varities - well under way. – other types of UNIX on their own - example SUN clones. – owners responsible for upgrade, with Infrastructure support.		
– HRDC reliant on other organizations - PWGSC specifically. – contract to March/99, then needs renewal. – Y2K compliant operating system expected by July/98.		
– Software - Windows95 not yet compliant. – UNISYS delcared compliant now. – other software vendors do not want to declare compliancy – some packages have no real owners (orphans), or have vendors who are no longer in business.		

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– Data base software expected to be compliant soon. – impact on mainframe will be the conversion effort. – expansion of datas fields impact not yet known. Communications Not as well defined or as much under control. – Some hardware/software pieces being tested now. – 3 main pieces - hubs, routers, network. – not sure how compliant [redacted] would react to new Bay routers. S.20 (1)(c) Carriers not yet looking at Y2K seriously. – [redacted] and other carriers have too much to lose to allow this low priority to continue. – telephony lab has now been set up (8th floor Fontaine Bldg). – S.20(1)(c)	Communications now recognized as an area of concern among those knowledgeable of the area. A compliant network operating system has not yet been achieved, and may not be fully achieved by the deadline. – S.20(1)(c) – A communications failure would be costly to HRDC at a time when resources will already be under pressure. – This may cause additional work to re-certify software late in the process.	Recommendation: Senior management should establish data communications as a top priority within the HRDC Y2K initiative. Project Management and Infrastrcuture Management should explore the alternatives, and present Senior Management with a clearly articulated action plan and contingency.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– [redacted] S.20(1)(b)(c) – HRDC now releasing 6.3, 8.0 to be compliant. – to take 6 months to convert every single server - 18 to 24 month roll out period. – [redacted] S.20(1)(b)(c) – [redacted] – $815 for Vines, $300 for BeyondMail, $400 for R&D and testing, and $300 for Banyan. – has also gone to C&I with this offer. – Suggestion has been made to move to a national framework with the 3 Network Operating Systems as standards - NT, Novell and Banyan as the means to decrease level of impact should Banyan be unsuccessful. – let regions choose which one to support locally. – also move to NOS-independent e-mail. – however, NOS contingency fund has been "withdrawn".		
Operations Software distribution being re-organized to allow regions to pull down new versions over the Internet. – Intended to resolve procedural bottleneck in distribution of software. – if everyone tries to sign on and download at the same time, impact on network will degrade service.	However, causes another potential bottleneck considering the large numbers of new releases for Y2K. – anyone who has tried to download files on the Internet can attest to this situation	It is suggested that the planned network impact study be completed before proceeding.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– network impact yet to be studied.		
B.5.2 Technology Transition		
Infrastructure elements show signs of being ready, but the inter-relationship can negate plans. – Getting experienced resources has been raised as a concern. – operations needs some lead time to prepare. – some ITCs doing this now, but not all. – LAN Administrators have been trained and prepared for implementation. – Multiple vendors, wide variety of hardware/software combinations a concern. – changes made late in the process will have the effect of causing massive re-testing. – some minor opinions that technology infrastructure moving too slowly to be ready in time. – Contingency for communications involves rolling back to earlier Vines release. – previous version known to be non-compliant. – would lose BeyondMail and Calendar applications. – expects Internet addresses to be available to replace mail. – NT being tested in pilot now	Platform readiness seen by Applications Groups as the main potential risk to ultimate delivery. – All the applications work for naught if platform not there. – Third party vendors a high risk due to variety and number of products in use. – Communications already a concern.	<u>Recommendation:</u> Infrastructure Management should develop a contingency plan based the analysis of different scenarios to mitigate the impact of network failure.

ACTIVITY	CONCLUSION / RISK	SUGGESTIONS & RECOMMENDATIONS
– some in-house expertise available. – could roll out but would cost a lot of $ for support/implementation/expertise in the field. – may not be able to make to move to NT within 2 years. – [redacted] s.20(1)(b)(c)		

APPENDIX C

OBJECTIVES

Because of the impact the millennium will have on HRDC, the objective of this audit, in partnership with the Year 2000 Project Office, is to provide an on-going proactive and value-added service to NHQ Systems and NHQ Service Delivery in support of the Year 2000 Project:

- by becoming involved at the beginning of this project;
- by reviewing and offering advice on deliverables;
- by doing regular risk assessments;
- by participating in meetings and testing; and,
- by continuing this process throughout the life of the project.

This will help to ensure the timely and effective Year 2000 conversion of all Information Technologies' applications and infrastructure for which HRDC is responsible in order to provide accurate, continuous and seamless systems' operations to all its clients beyond the year 2000. As per the Year 2000 Project Charter mandate of March 5, 1997, which states that there will be:

- Zero loss of service to the public;
- Zero unplanned production downtime;
- System compliance, prior to December 31, 1998;
- IT process predictability and repeatability; and,
- Sustained operational and technical credibility.

The IAB has identified, through several years' experience with Systems Under Development (SUD) auditing, that there are major benefits and value to be derived from this kind of auditing. In fact, auditor participation in the development process is probably the best use of audit resources in a computerised business environment. It provides an independent and timely identification of potentially costly problems in project management and systems' design/ implementation. The potential payoff from SUD auditing is even greater now, given current levels of HRDC's systems' development.

Benefits from auditing specific systems under development vary according to the phases of development. Specific benefits derived are:

- As in the early phases of the System Development Life Cycle (SDLC), communication between the user and MIS is critical to the solution of a business problem. Informatic Technology and Systems' (IT&S) auditors can analyse objectively, both sides of the communication to ensure that all parties have the same understanding throughout the early phases of development.

- Timely involvement in the feasibility study process enables the IT&S auditors to identify these problems and have them corrected.

- The payoff in reviewing controls' design, particularly during the general design phase, is described often in terms of higher costs of implementing controls, after the system has been implemented. However, the controls' design issue is wide open at this point in the SDLC.

- Plans for conversion and testing should be formulated as early as the initiation stage. Through each phase, these plans become increasingly detailed. Again, appropriate involvement will ensure that conversion and testing are well done.

For this SUD audit, the bottom line is to ensure that the informatics technology and systems which are impacted are identified or developed, modified and purchased under an appropriate disciplinary regime. Throughout the SDLC, the auditor will ensure that departmental policies and procedures are adhered to, or if not, that there are appropriate reasons and authorities for not doing so.

Finally, the benefits of auditing the general management of systems under development have a leveraged impact because any improvements made in this area will impact on all systems under development. Therefore, audit participation in the assessment of the management of systems is essential and the objectives of the audit team in this area are to:

- provide assistance and advice in development of control techniques;

- assess the effectiveness, efficiency and economy of development to meet HRDC's needs/requirements;

- determine the adequacy of management practices and controls over development, modifications and purchases;

- determine the extent and adequacy of internal systems controls and environmental controls, to ensure completeness, accuracy and authenticity of data that is processed and stored; and,

- determine the extent of compliance of development and management practices.

APPENDIX D

SCOPE

Systems' development teams now recognise the advantage of continuous monitoring of the development cycle from inception to implementation. Implementing controls after-the-fact is not acceptable within this Year 2000 project. Therefore, the scope of this audit by means of risk assessments, will encompass some of the controls over systems' development, such as:

- Management and Organisation
  - Senior Management Control Framework
  - Change Management

- Business Definitions
  - Business Requirements
  - Solution Design
  - Management of Change

- Project Structures
  - Organisation and Management
  - Control Process
  - Development Process

- Technical Structures
  - Infrastructure
  - Technical Transition

The IAB will review the entities as described in the Treasury Board document "Survey of Year 2000 Readiness in the Canadian Federal Government", March 4, 1997. They include, but are not limited to:

- Inventory;
- Assessment;
- Mission criticality identified;
- Year 2000 plan;
- Year 2000 funding;
- System dependencies mapped;
- System dependencies synchronised;
- Year 2000 repairs/replacement;
- Year 2000 testing; and,
- Human Resource/Personnel requirements.